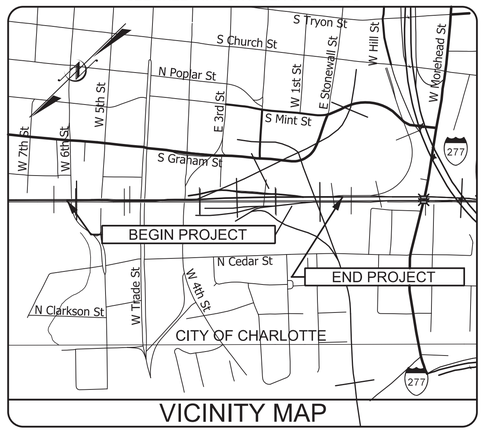
0009DEL_P28

TIP PROJECT: P–5705BA

CONTRACT: RD–18002

SEE SHEET 1A FOR INDEX OF SHEETS



VICINITY MAP

STATE OF NORTH CAROLINA
RAIL DIVISION

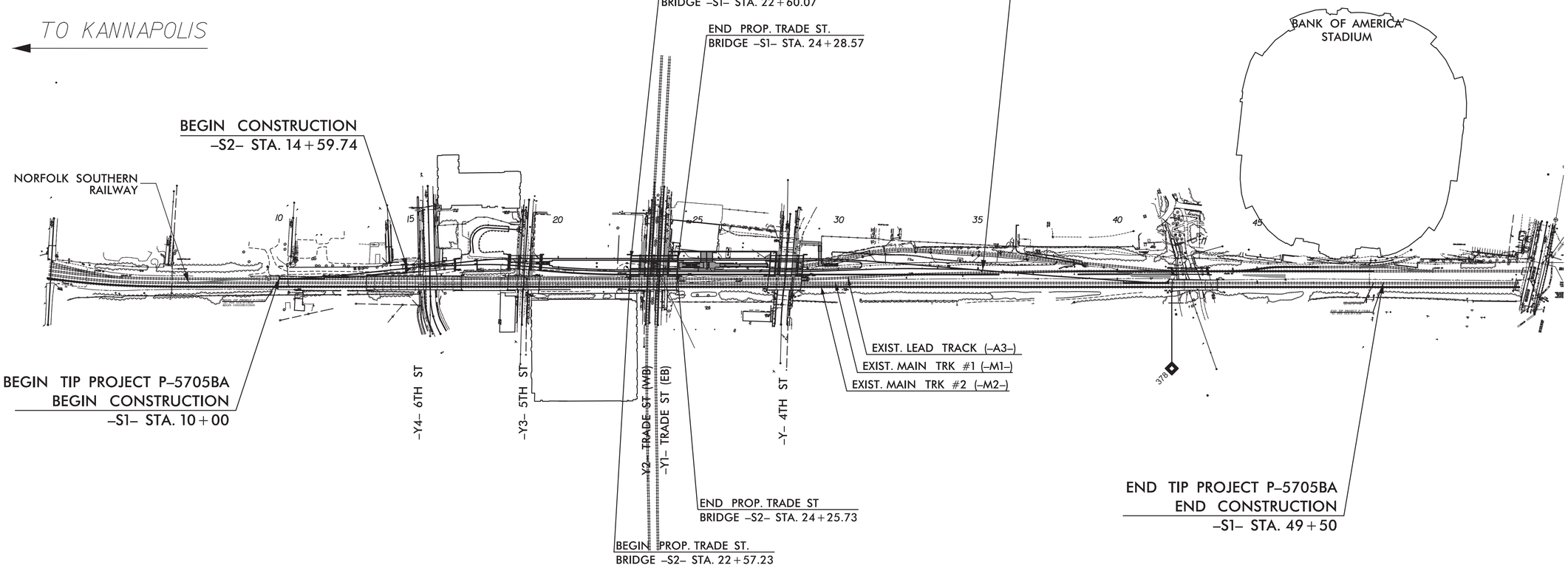
MECKLENBURG COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5705BA	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44475.1.2		P.E. / UTIL P.E. / ROW
44475.3.2		CONST./UTIL CONST.

LOCATION: CHARLOTTE GATEWAY STATION – TRACK, STRUCTURE AND SIGNALS

TYPE OF WORK: STRUCTURE AND TRAFFIC CONTROL



PROJECT LENGTH

LENGTH OF RAIL TIP PROJECT	0.612 MILES
LENGTH OF STRUCTURES TIP PROJECT	0.136 MILES
TOTAL LENGTH OF RAIL TIP PROJECT	0.748 MILES

LENGTH MEASURED ALONG -S1-

NCDOT CONTACT: MATTHEW SIMMONS, P.E.
NCDOT PROJECT MANAGER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: DECEMBER 22, 2017

COREY VERNIER, P.E.
RAIL PROJECT ENGINEER

DAVID HAWKINS, P.E.
STRUCTURE PROJECT ENGINEER

MATTHEW SIMMONS, P.E.
NCDOT PROJECT MANAGER

STRUCTURES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27812 ENGINEER DAVID W. HAWKINS

DocuSigned by: David Hawkins 48655487...
SIGNATURE *P.E.* 12/21/2017

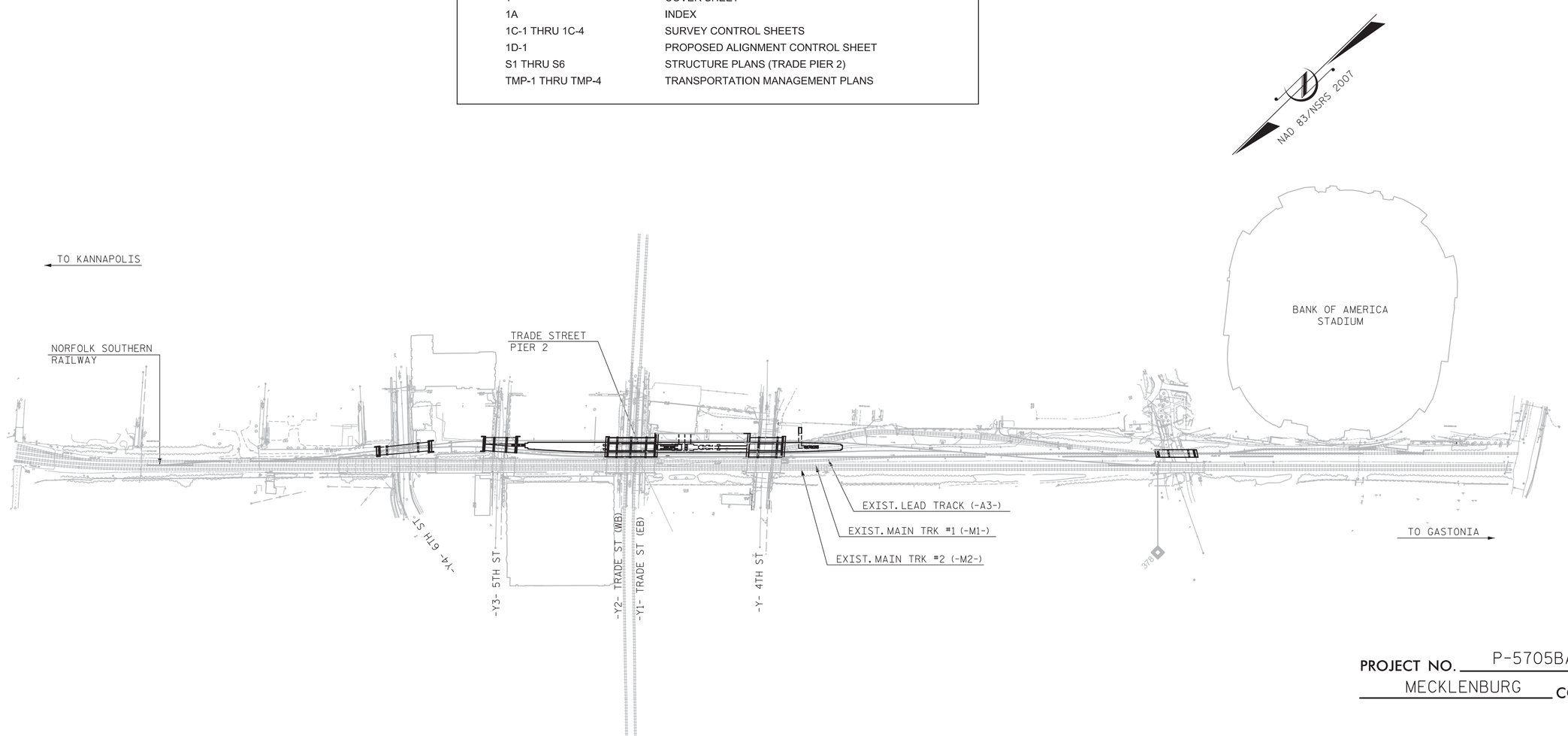
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
DESIGN AND CONSTRUCTION

0009DEL_P28

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
1A	INDEX
1C-1 THRU 1C-4	SURVEY CONTROL SHEETS
1D-1	PROPOSED ALIGNMENT CONTROL SHEET
S1 THRU S6	STRUCTURE PLANS (TRADE PIER 2)
TMP-1 THRU TMP-4	TRANSPORTATION MANAGEMENT PLANS



PROJECT NO. P-5705BA

MECKLENBURG **COUNTY**

NORTH CAROLINA PROFESSIONAL SEAL 27812 ENGINEER DAVID W. HAWKINS

DocuSigned by: David Hawkins A9ED7524B855487...

12/21/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 10/17
CHECKED BY D. HAWKINS DATE 10/17

DWG. NO.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	1A
1			3			TOTAL SHEETS
2			4			

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
P-5705B	1C-1
Location and Surveys	

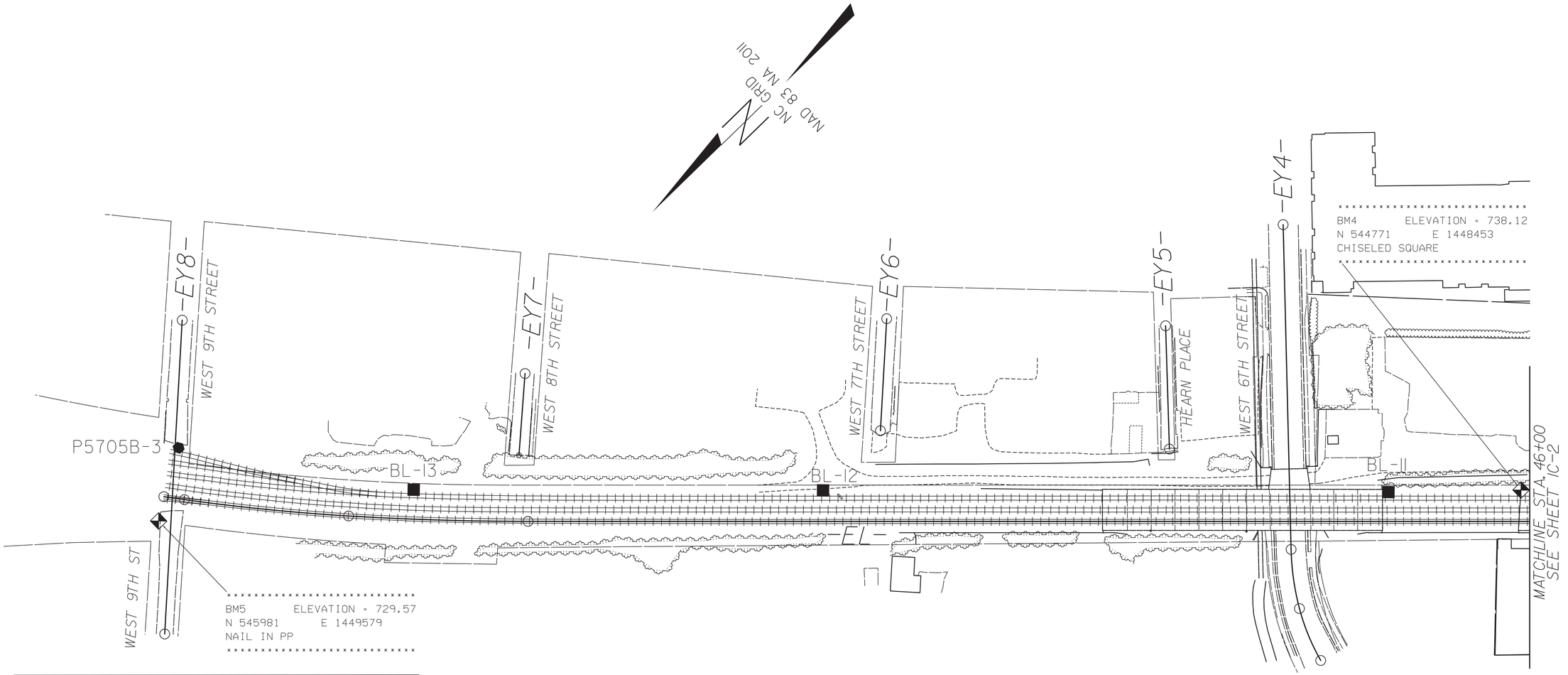
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

TO KANNAPOLIS

TO GASTONIA

P5705B-4



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P5705B-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 542629.390(ft) EASTING: 1445444.637(ft) ELEVATION: 683.308(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998447800
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P5705B-2" TO -S1- STATION 10+00.00 IS N 52°33'53.8" E 4499.67'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

12/8/2017
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6/2/99

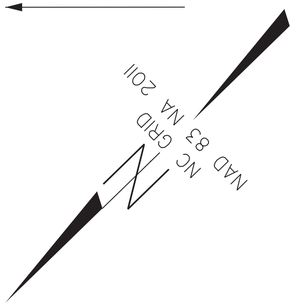
PROJECT REFERENCE NO.	SHEET NO.
P-5705B	1C-2
Location and Surveys	

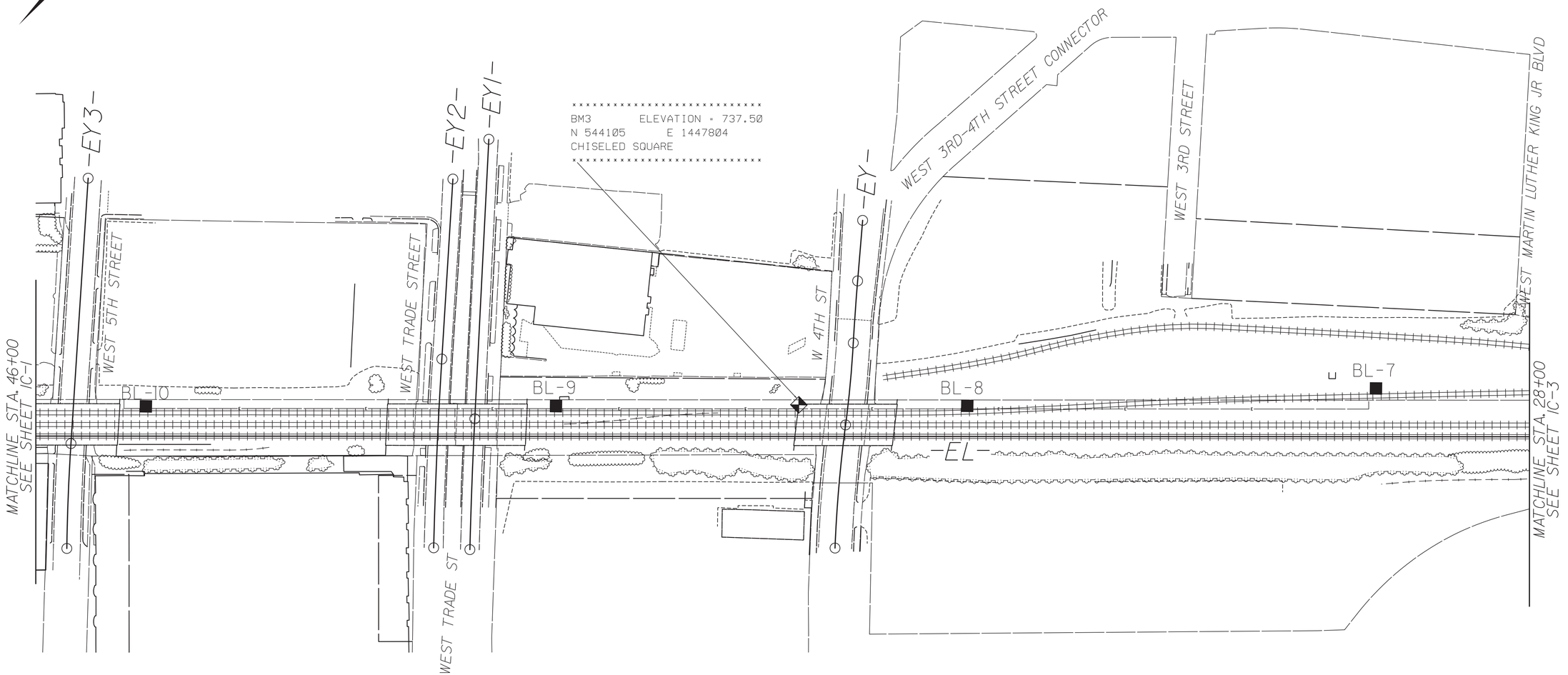
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

TO KANNAPOLIS

TO GASTONIA





NOTE: DRAWING NOT TO SCALE

NOTES:

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12/6/2017
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6/2/99

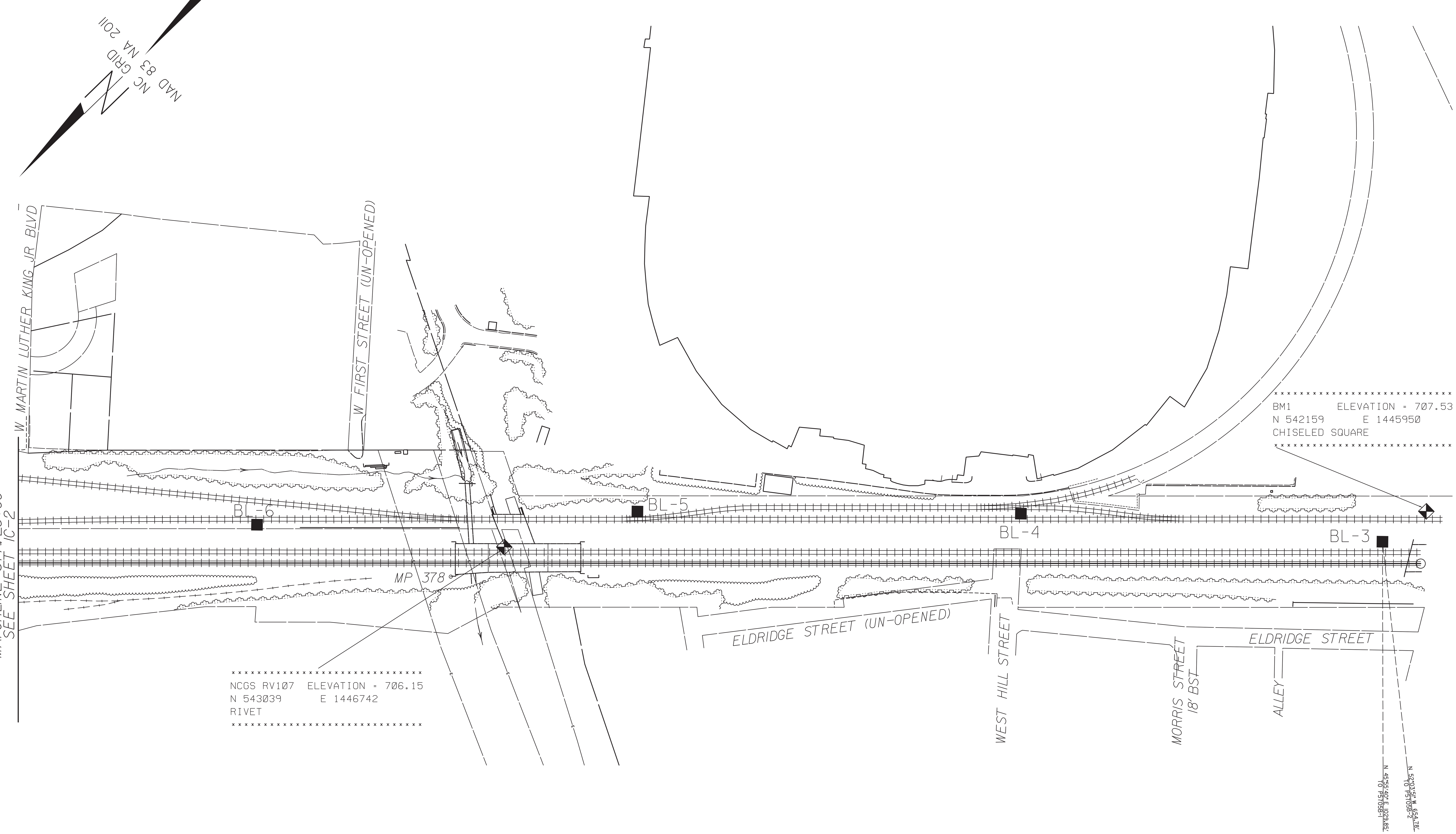
PROJECT REFERENCE NO.	SHEET NO.
P-5705B	1C-3
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

TO KANNAPOLIS

TO GASTONIA



NOTES:

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2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

12/8/2017
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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
P-5705B	1C-4
Location and Surveys	

SURVEY CONTROL SHEET

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	GPS P5705B-1	542943.1696	1445221.1543	670.09
2	GPS P5705B-2	542629.3900	1445444.6370	683.31
3	BL-3	542226.8456	1445961.0633	711.07
4	BL-4	542534.2325	1446310.5454	706.62
5	BL-5	542885.1262	1446655.7118	706.95
6	BL-6	543246.8513	1446984.0832	713.51
7	BL-7	543592.5959	1447333.3859	724.54
8	BL-8	543960.2705	1447661.8381	735.08
9	BL-9	544315.6877	1448007.2578	737.60
10	BL-10	544670.0759	1448351.7409	737.03
11	BL-11	544887.9468	1448563.5695	735.72
12	BL-12	545377.9010	1449043.5256	730.95
13	BL-13	545733.0461	1449390.5540	728.48
14	GPS P5705B-3	545901.9120	1449625.9940	728.32
15	GPS P5705B-4	545446.5087	1450075.8714	737.50

****
BM1 ELEVATION = 707.53
N 542159 E 1445950
CHISELED SQUARE
****
****
BM2 ELEVATION = 706.15
N 543039 E 1446742
RIVET
****
****
BM3 ELEVATION = 737.50
N 544105 E 1447804
CHISELED SQUARE
****
****
BM4 ELEVATION = 738.12
N 544771 E 1448453
CHISELED SQUARE
****
****
BM5 ELEVATION = 729.57
N 545981 E 1449579
NAIL IN PP
****
****
NCGS RV107 ELEVATION = 706.15
N 543039 E 1446742
RIVET
****

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	542211.253	1445906.755							
LINE			N 44°14'46.1" E	4814.93					
PC	545660.421	1449266.331							
CURVE			N 45°57'35.6" E	217.82	03°25'39.1"(RT)	01°34'24.0"	217.85	108.96	3641.71
PCC	545811.842	1449422.912							
CURVE			N 49°55'18.7" E	200.11	04°29'47.0"(RT)	02°14'47.1"	200.16	100.13	2550.55
PCC	545940.677	1449576.028							
CURVE			N 52°24'58.5" E	25.23	00°29'32.7"(RT)	01°57'06.5"	25.23	12.61	2935.53
PT	545940.677	1449576.028							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	543894.750	1447910.079							
LINE			N 41°01'12.8" W	73.23					
PC	543949.998	1447862.018							
CURVE			N 41°48'53.5" W	74.95	01°35'21.4"(LT)	02°07'12.9"	74.96	37.48	2702.32
PCC	544005.862	1447812.044							
CURVE			N 40°25'12.6" W	99.17	04°22'43.2"(RT)	04°24'50.5"	99.20	49.62	1298.04
PCC	544081.365	1447747.740							
CURVE			N 40°52'55.1" W	148.99	05°18'08.1"(LT)	03°33'27.5"	149.04	74.57	1610.51
PT	544081.365	1447747.740							

EY1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	544149.466	1448294.217							
LINE			N 42°54'13.0" W	337.21					
PC	544396.472	1448064.655							
CURVE			N 43°37'33.0" W	157.78	01°26'40.0"(LT)	00°54'55.6"	157.79	78.90	6258.87
PT	544396.472	1448064.655							

EY2

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	544213.920	1448290.108							
LINE			N 42°16'05.4" W	217.32					
PC	544374.735	1448143.941							
CURVE			N 43°18'11.5" W	227.69	02°04'12.2"(LT)	00°54'32.7"	227.70	113.86	6302.54
PT	544374.735	1448143.941							

EY3

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	544528.238	1448597.381							
LINE			N 42°04'21.4" W	320.44					
PC	544766.096	1448382.666							
CURVE			N 43°32'07.4" W	126.52	02°55'32.0"(LT)	02°18'43.3"	126.54	63.28	2478.15
PT	544766.096	1448382.666							

EY4

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	544753.376	1448885.088							
LINE			N 47°09'58.1" W	393.81					
PC	545021.115	1448596.298							
CURVE			N 53°48'34.0" W	72.36	13°17'11.8"(LT)	18°19'15.9"	72.52	36.42	312.73
PCC	545063.841	1448537.901							
CURVE			N 68°03'15.8" W	68.06	15°12'11.7"(LT)	22°16'15.9"	68.26	34.33	257.27
PT	545063.841	1448537.901							

EY5

POINT	N	E	BEARING	DIST
POT	544941.038	1448896.711		
LINE			N 47°31'55.9" W	149.53
POT	545042.000	1448786.406		

EY6

POINT	N	E	BEARING	DIST
POT	545177.393	1449138.838		
LINE			N 42°32'40.2" W	136.00
POT	545277.592	1449046.880		

EY7

POINT	N	E	BEARING	DIST
POT	545538.047	1449397.267		
LINE			N 41°29'52.3" W	99.23
POT	545612.365	1449331.521		

EY8

POINT	N	E	BEARING	DIST
POT	545790.830	1449733.737		
LINE			N 42°33'48.3" W	380.99
POT	546071.439	1449476.035		

NOTES:

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12/8/2017
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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
P-5705B	1D-1
Location and Surveys	

PROPOSED ALIGNMENT CONTROL SHEET

A1

TYPE	STATION	NORTH	EAST
POT	35+87.79	543496.7714	1447233.8636
POT	36+19.04	543476.2284	1447210.3148
PC	38+47.19	543309.8433	1447054.2047
PT	39+53.72	543232.8411	1446980.5999
POT	48+42.17	542596.3343	1446360.7516
POT	49+15.28	542543.8320	1446309.8770

A6

TYPE	STATION	NORTH	EAST
POT	44+11.83	542904.6403	1446660.9888
POT	44+41.83	542883.1477	1446640.0587
PC	45+32.64	542810.7032	1446585.2941
PT	45+92.21	542765.4617	1446546.4327
POT	47+18.47	542674.9999	1446458.3519

S1

TYPE	STATION	NORTH	EAST
POT	10+00.00	545364.5649	1449017.5662
POT	10+39.98	545335.9225	1448989.6733
TS	11+56.77	545247.0124	1448913.9457
SC	11+96.77	545216.4857	1448888.0979
CS	12+53.24	545172.7295	1448852.3906
ST	12+93.24	545141.2854	1448827.6669
POT	12+98.24	545137.3459	1448824.5879
POT	13+38.22	545105.8457	1448799.9681
POT	14+59.74	545010.1003	1448725.1357
POT	14+99.72	544978.6001	1448700.5159
TS	16+73.33	544841.8174	1448593.6098
SC	17+35.33	544793.2629	1448555.0575
CS	18+19.93	544729.5302	1448499.4104
ST	18+81.93	544684.7830	1448456.4976
TS	28+53.03	543989.0635	1447778.9861
SC	28+84.03	543966.8870	1447757.3250
CS	31+32.61	543796.0340	1447576.8418
ST	31+63.61	543775.6202	1447553.5121
POT	33+11.81	543678.1944	1447441.8315
POT	33+51.79	543651.9125	1447411.7041
POT	34+77.81	543569.0698	1447316.7403
POT	35+17.79	543542.7879	1447286.6129
POT	35+87.79	543496.7714	1447233.8636
POT	36+19.04	543476.2284	1447210.3148
TS	36+98.79	543423.8025	1447150.2182
SC	37+29.79	543403.4028	1447126.8762
CS	37+81.55	543369.0985	1447088.1213
ST	38+12.55	543348.4054	1447065.0390
POT	41+44.04	543126.9013	1446818.4088
POT	41+84.02	543098.2655	1446790.5091
POT	49+50.00	542549.6314	1446255.9797

S2

TYPE	STATION	NORTH	EAST
POT	14+59.74	545010.1003	1448725.1357
POT	14+99.72	544978.6001	1448700.5159
TS	16+58.94	544859.9602	1448594.3327
SC	17+20.94	544814.0808	1448552.6326
CS	18+17.49	544746.0421	1448484.1231
ST	18+79.49	544704.6596	1448437.9570
TS	19+86.23	544634.0276	1448357.9348
SC	20+17.23	544613.4785	1448334.7241
CS	22+45.81	544455.8812	1448169.2106
ST	22+76.81	544433.7047	1448147.5495
TS	28+04.14	544055.9098	1447779.6421
SC	28+35.14	544033.6683	1447758.0478
CS	29+27.51	543966.3466	1447694.8013
ST	29+58.51	543943.4072	1447673.9498
TS	31+09.22	543831.7313	1447572.7444
SC	31+71.22	543785.9406	1447530.9451
CS	32+54.09	543725.9611	1447473.7618
ST	33+16.09	543682.0250	1447430.0173
POT	34+76.06	543569.0698	1447316.7403
POT	35+16.04	543542.7879	1447286.6129

Y5

TYPE	STATION	NORTH	EAST
POT	10+00.00	543344.1813	1447318.1107
PC	10+80.08	543401.0694	1447261.7529
PT	11+08.41	543403.1978	1447235.8219
POT	13+34.24	543270.8262	1447052.8461

Y6

TYPE	STATION	NORTH	EAST
POT	10+29.00	544802.8691	1448599.9271
PC	10+64.06	544781.1647	1448627.4549
PT	11+50.97	544704.8336	1448630.0532
POT	12+74.93	544621.6394	1448538.1527

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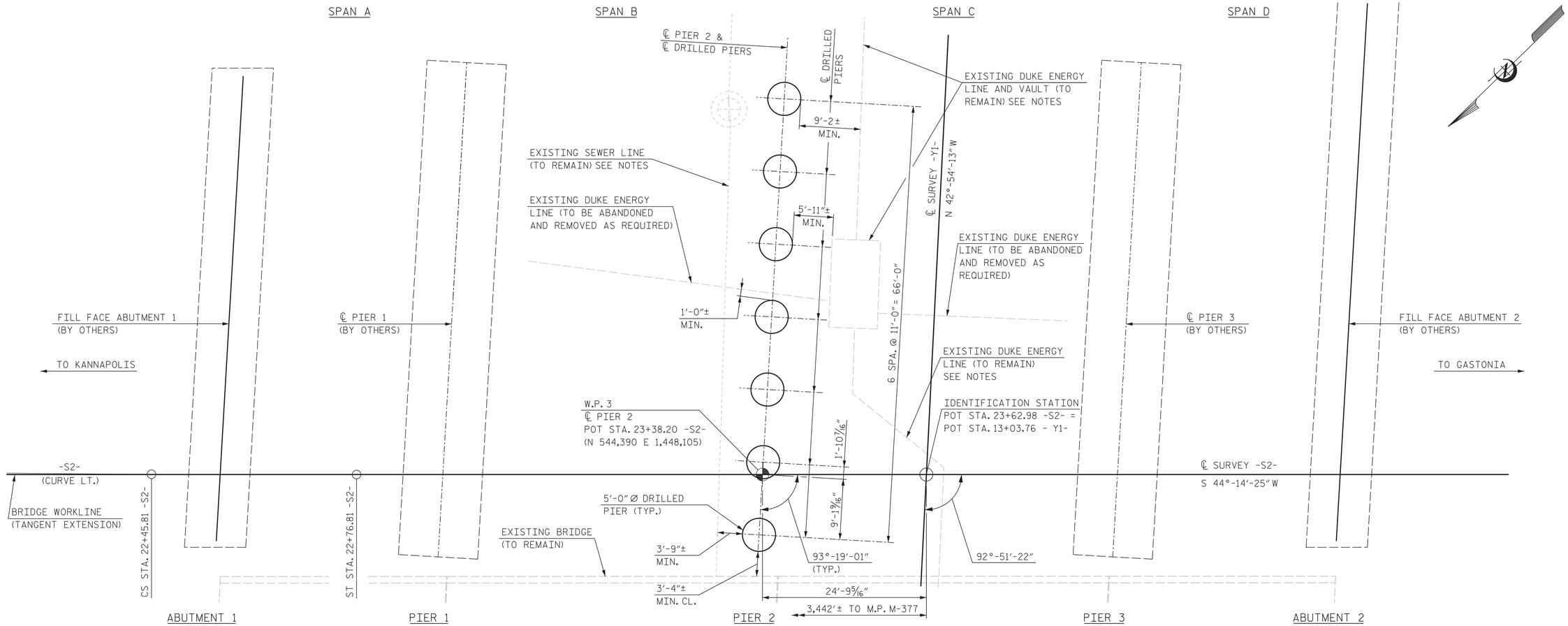


FOUNDATION LAYOUT

FOUNDATION NOTES:

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 540 TONS PER DRILLED PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP BEARING OF 20 TSF.

INSTALL DRILLED PIERS TO A TIP ELEVATION NO HIGHER THAN 653 FT. (1), 648 FT. (2), 649.5 FT. (3), 652 FT. (4), 656.5 FT. (5), 657 FT. (6), AND 641.5 FT (7), SATISFY THE REQUIRED TIP BEARING AND HAVE A PENETRATION OF AT LEAST 20 FT INTO WEATHERED ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS. DRILLED PIERS ARE NUMBERED LEFT TO RIGHT LOOKING AHEAD STATION.

PERMANENT, SEGMENTAL OR CONTINUOUS STEEL CASING IS REQUIRED AT DRILLED PIER NO. 7. INSTALL CASING TO ELEV. 670 FT.

FOR DRILLED PIERS NOS. 1 THROUGH 6, INSTALL A TEMPORARY CASING A MINIMUM OF 20 FT BELOW DRILLING GRADE PRIOR TO BEGINNING SLURRY EXCAVATION.

SPT ARE REQUIRED FOR DRILLED PIERS. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

POLYMER SLURRY CONSTRUCTION IS REQUIRED FOR DRILLED PIERS.

THE DRILLED PIER CONTRACTOR IS REQUIRED TO HAVE A TECHNICALLY COMPETENT REPRESENTATIVE PRESENT DURING CONSTRUCTION OF DRILLED PIER NO. 7 OR AS DIRECTED BY THE ENGINEER.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES AND TESTING ARE REQUIRED FOR DRILLED PIERS. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THERMAL INTEGRITY PROFILING IS REQUIRED FOR DRILLED PIERS. FOR THERMAL INTEGRITY PROFILING, SEE GEOTECHNICAL SPECIAL PROVISION.

THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES WITHIN THE VICINITY OF PIER CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

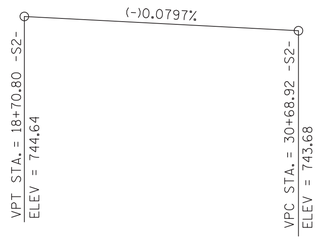
ALL DIMENSIONS ARE PARALLEL OR NORMAL TO ℄ PIER.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE "SUBSTRUCTURE: PIER 2" SHEETS.

FOR ABUTMENT 1, PIER 1, PIER 3, AND ABUTMENT 2, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

-S2- TRACK CURVE DATA

PIs STA. 22+56.14
Δs = 0° 15′ 30.0″ (LT.)
Ls = 31.00′
LT = 20.67′
ST = 10.33′



GRADE DATA -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP
DocuSigned by: Joel R. Rapp 02DC72E6F2C84F8...
12/21/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 9/17
CHECKED BY J. RAPP DATE 10/17
DWG. NO. 1

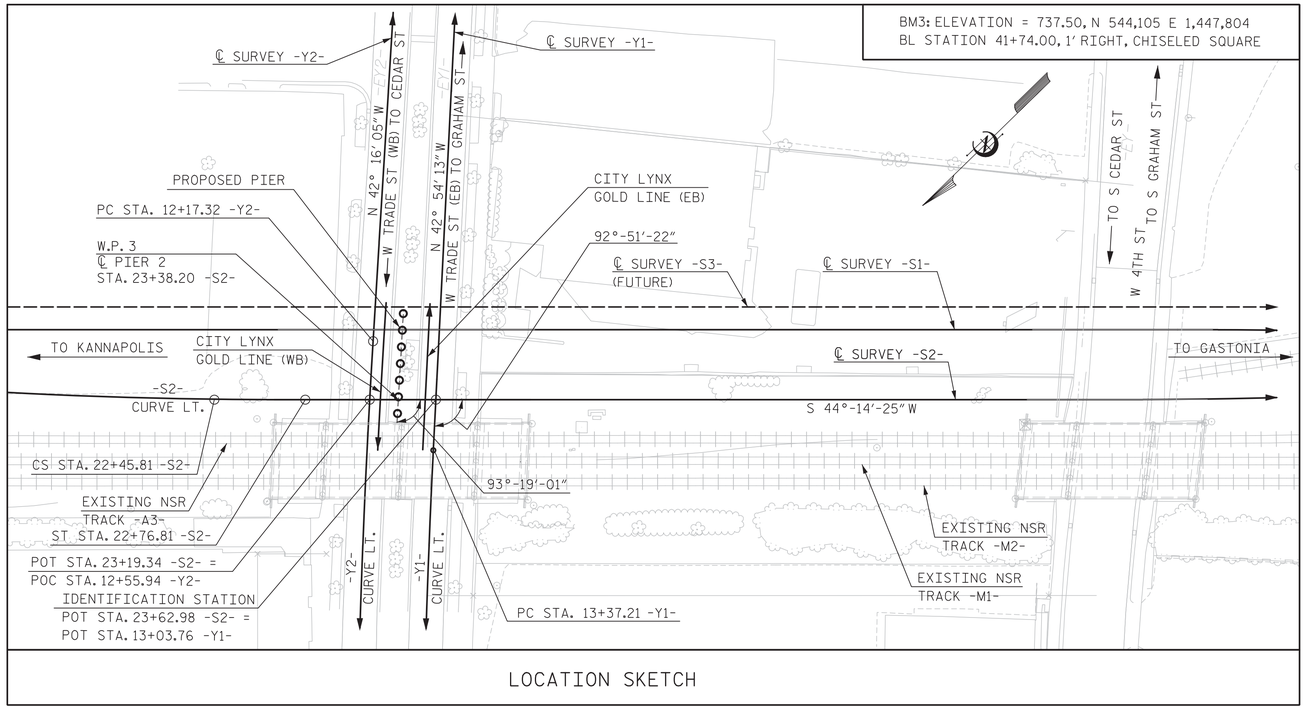
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POT STA. 23+62.98 -S2-
MILE POST: NS 377.64
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT
AND
FOUNDATION NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-1
1			3			TOTAL SHEETS
2			4			6

0009DEL_P28



LOCATION SKETCH

TOTAL BILL OF MATERIAL												
	5'-0" DIA. DRILLED PIERS IN SOIL	5'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	SID INSPECTIONS	SPT TESTING	THERMAL INTEGRITY PROFILER	CSL TESTING	CLASS AA CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	WATERPROOFING	METHOD B DAMPPROOFING
	L.F.	L.F.	L.F.	EACH	EACH	EACH	EACH	CU. YARDS	LBS.	LBS.	SQ. YARDS	SQ. YARDS
✳PIER 2	356.3	111	167.8	7	7	7	7	48.1	87,124	38,393	27.5	28.4
TOTAL	356.3	111	167.8	7	7	7	7	48.1	87,124	38,393	27.5	28.4

✳PIER 2 QUANTITIES ARE FOR COLUMNS AND DRILLED PIERS ONLY. FOR CAP AND PLATFORM GIRDER STEM WALL QUANTITIES, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: Joel R. Rapp 02DC72E6F2C64F8...

12/21/2017

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NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 9/17
CHECKED BY L. RAPP DATE 10/17
DWG. NO. 2

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POT STA. 23+62.98 -S2-
MILE POST: NS 377.64
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH AND TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-2
1			3			TOTAL SHEETS
2			4			6

0009DEL_P28

GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THIS PIER HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

THIS PIER HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S" MANUAL FOR RAILWAY ENGINEERING VOL. 2, CHP. 9, SEISMIC DESIGN FOR RAILWAY".

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80.

DAMPPROOFING: PIER COLUMNS UP TO GROUND LINE SHALL BE DAMPPROOFED WITH METHOD "B" DAMPPROOFING.

WATERPROOFING IS REQUIRED ALONG FULL CIRCUMFERENCE OF EACH BOTTOM OF COLUMN TO TOP OF DRILLED PIER INTERFACE.

WATERPROOFING SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2018, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS.

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS ¾" EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND COMPLIANT WITH THE DESIGN STANDARDS OF NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY, AS A SUBMITTAL THROUGH THE ENGINEER, AT LEAST TWO WEEKS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.

FOR BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

INDEX OF DRAWINGS

FOR PIER 2 CAP AND PLATFORM GIRDER STEM WALL, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR ABUTMENT 1, PIER 1, PIER 3, AND ABUTMENT 2 SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR TRACK 1 SUPERSTRUCTURE SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

FOR TRACK 2 SUPERSTRUCTURE SHEETS, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: Joel R. Rapp 02DC72E6F2C64F8...

12/21/2017

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DWG. NO. 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

GENERAL NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-3
1			3			TOTAL SHEETS
2			4			6

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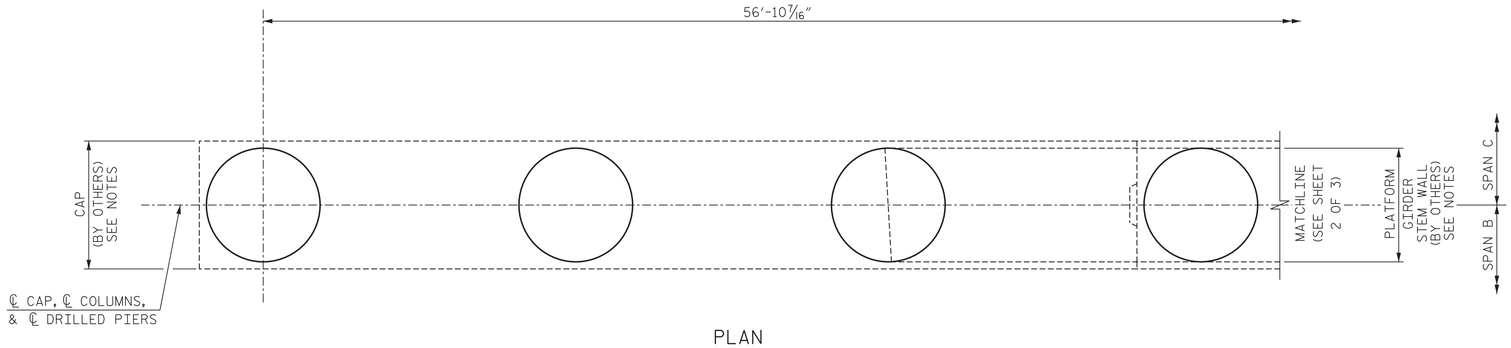
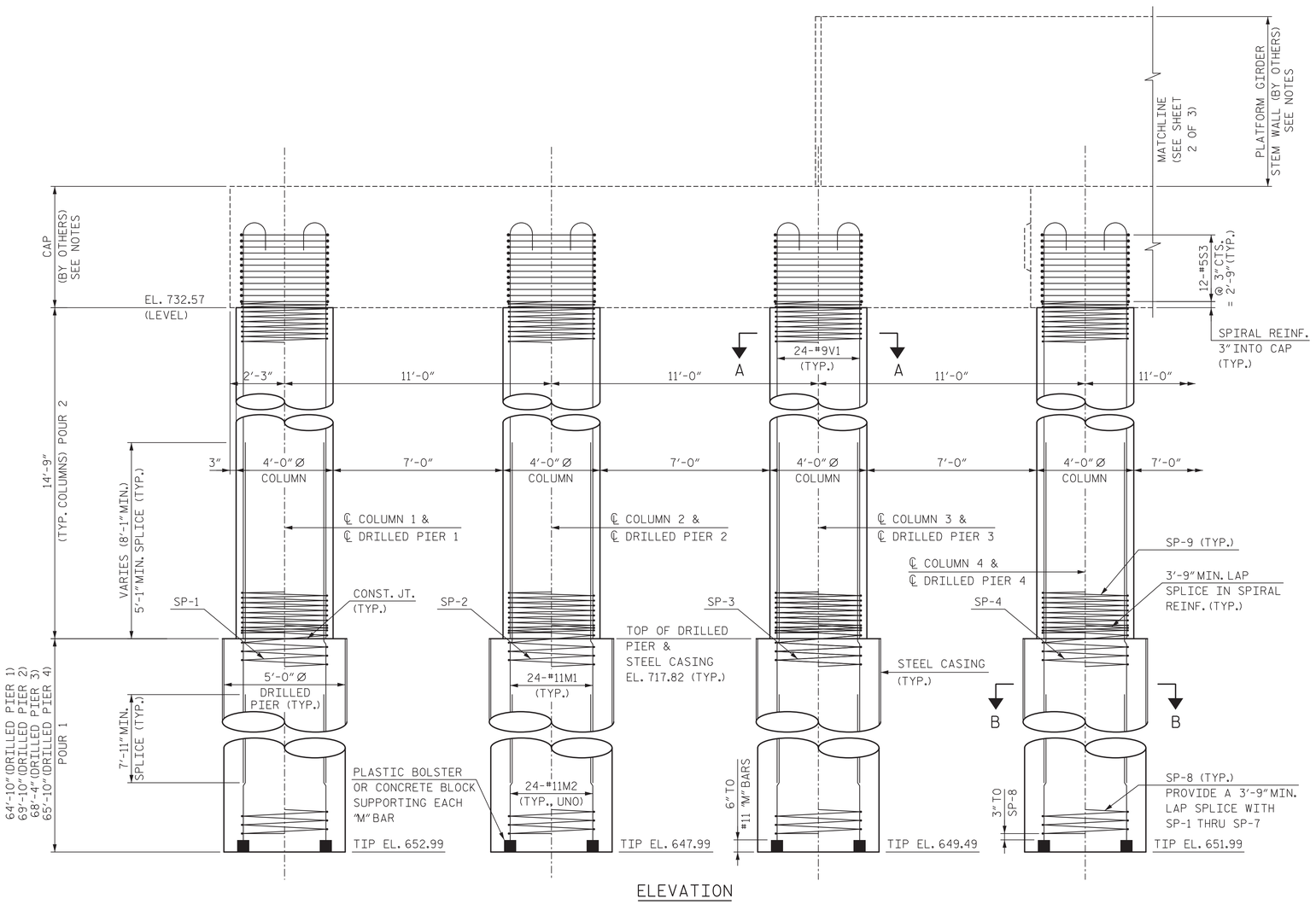


PLAN



ELEVATION

NOTES:

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO ℄ PIER UNLESS NOTED.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FT. OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1'-0" BELOW THE GROUND LINE.

FOR CAP AND PLATFORM GIRDER STEM WALL, REFER TO P-5705BA (C204058) PLANS (BY OTHERS).

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 2

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP
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12/21/2017

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-4
1			3			TOTAL SHEETS
2			4			6

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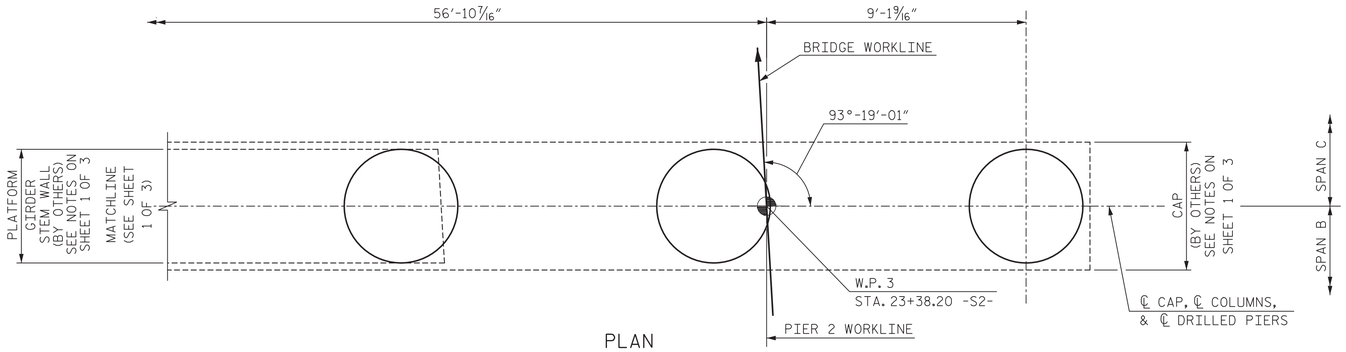
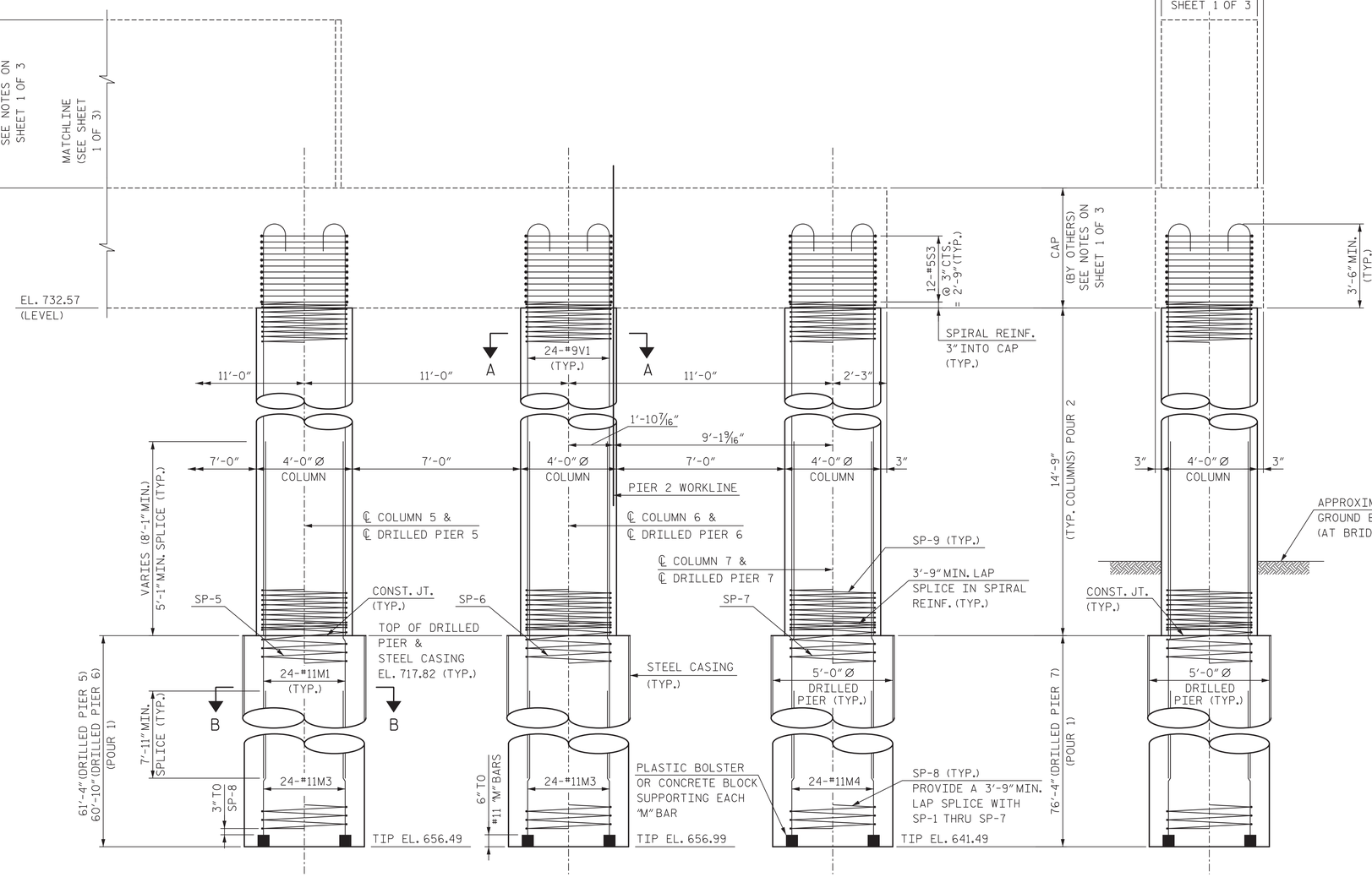
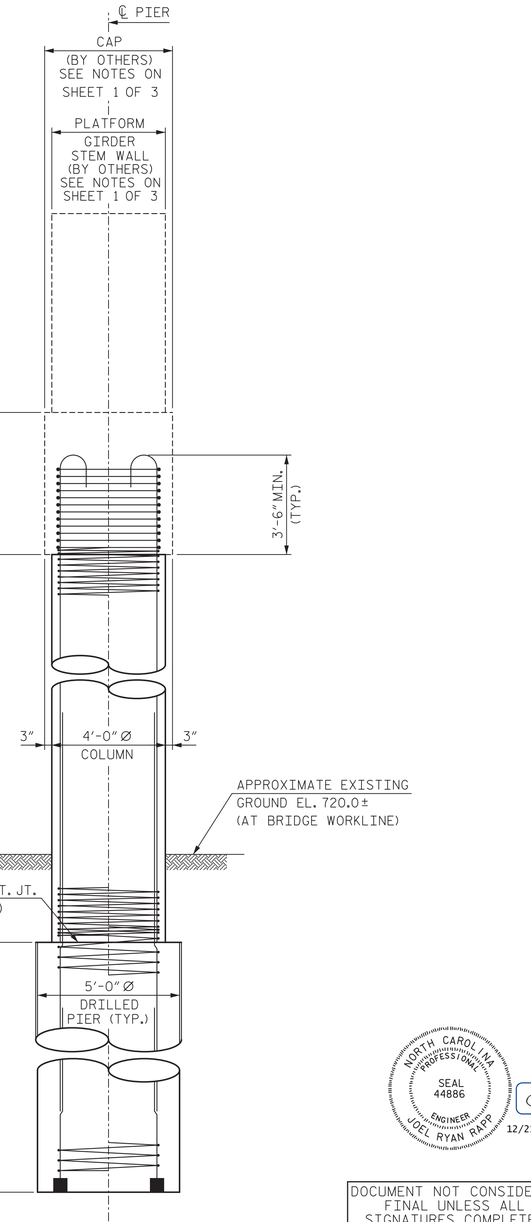


PLAN



ELEVATION



END ELEVATION

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 2

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-5
1			3			TOTAL SHEETS
2			4			6

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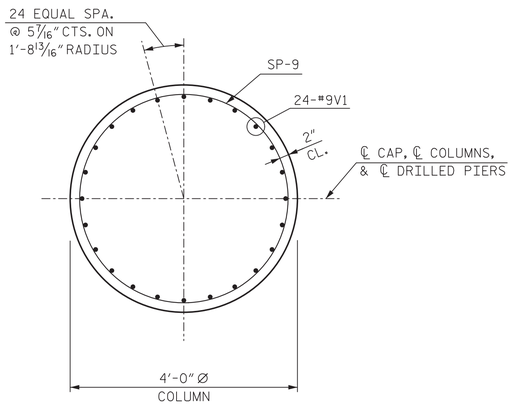
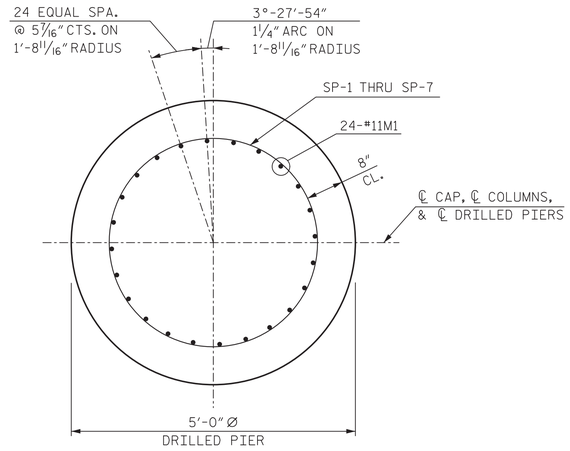
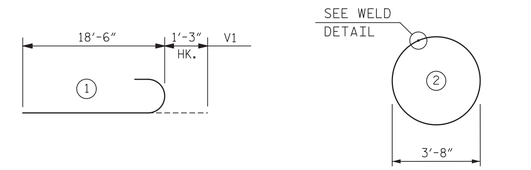


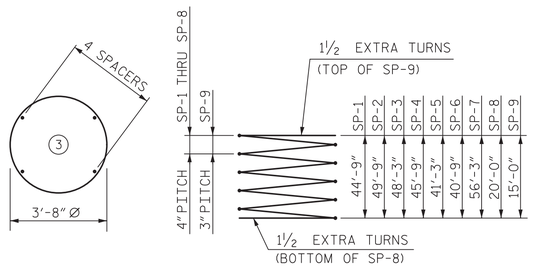
SECTION A-A

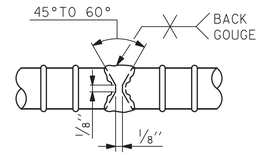


SECTION B-B

BAR TYPES







WELD DETAIL

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

PIER 2

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ S3	84	5	2	11'-7"	1,015
M1	168	11	STR.	60'-0"	53,555
M2	96	11	STR.	25'-4"	12,921
M3	48	11	STR.	16'-10"	4,293
M4	24	11	STR.	31'-10"	4,059
V1	168	9	1	19'-9"	11,281
SP-1	1	✳✳	3	1,546'-7"	3,161
SP-2	1	✳✳	3	1,719'-5"	3,514
SP-3	1	✳✳	3	1,667'-7"	3,409
SP-4	1	✳✳	3	1,581'-2"	3,232
SP-5	1	✳✳	3	1,425'-8"	2,914
SP-6	1	✳✳	3	1,408'-4"	2,879
SP-7	1	✳✳	3	1,944'-0"	3,974
SP-8	7	✳✳	3	708'-6"	10,137
SP-9	7	✳✳✳	3	708'-6"	5,173

QUANTITIES

ITEM		TOTAL
REINFORCING STEEL	LBS	87,124
SPIRAL COLUMN REINFORCING STEEL	LBS	38,393
CLASS AA CONCRETE:		
POUR 2	C.Y.	48.1
TOTAL	C.Y.	48.1
5'-0" DIA. DRILLED PIERS	NO.	7
DRILLED PIER IN SOIL	L.F.	356.3
DRILLED PIER NOT IN SOIL	L.F.	111
DRILLED PIER CONCRETE POUR 1	C.Y.	339.9
PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	L.F.	167.8
SID INSPECTIONS	EACH	7
SPT TESTING	EACH	7
CSL TESTING	EACH	7
THERMAL INTEGRITY PROFILER	EACH	7

✳ #5S3 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315.80.

✳✳ THE SP-1 THRU SP-8 SPIRAL REINFORCING STEEL SHALL BE #7 PLAIN OR DEFORMED BAR.

✳✳✳ THE SP-9 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

MILE POST: NS 377.64

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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12/21/2017

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DWG. NO. 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

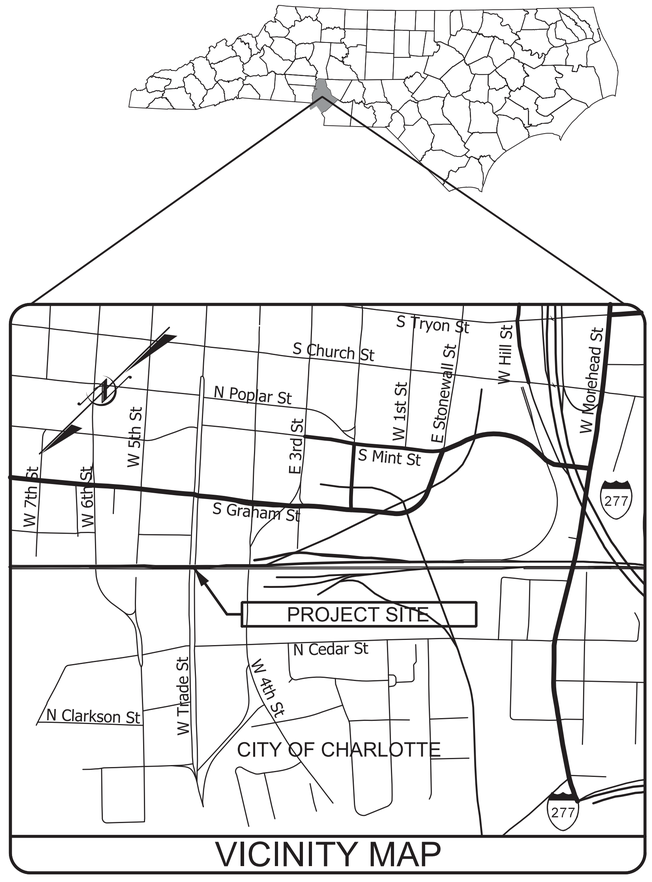
PIER 2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-6
1			3			TOTAL SHEETS
2			4			6

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MECKLENBURG COUNTY



VICINITY MAP

LOCATION: CHARLOTTE GATEWAY STATION – TRACK, STRUCTURE AND SIGNALS

TYPE OF WORK: DRAINAGE, PAVING, GRADING, STRUCTURE

NCDOT CONTACT: MATTHEW SIMMONS, P.E.
NCDOT PROJECT MANAGER

INDEX OF SHEETS

SHEET NO.
TMP–1

P–5707BA

TIP PROJECT:

R. B. EARLY, P.E. *TRAFFIC CONTROL PROJECT ENGINEER*
R. B. EARLY, P.E. *QUALITY CONTROL ENGINEER*
J. PHILLIPS *TRAFFIC CONTROL DESIGN ENGINEER*

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343 E. Six Forks Road, Ste 200
Raleigh, North Carolina 27609
NC License No: C-1554

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 12/21/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

12/20/2017
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HNTB

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 12/21/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

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CDOT – WORK AREA TRAFFIC CONTROL HANDBOOK

THE CHARLOTTE DEPARTMENT OF TRANSPORTATION - WORK AREA TRAFFIC CONTROL HANDBOOK ("WATCH") - IS APPLICABLE TO THIS PROJECT AND CONSIDERED A PART OF THESE PLANS.

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANAUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1180.01	SKINNY-DRUM

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL
- INCIDENTAL STONE
- WEDGE / WIDEN (USING FLAGGERS)
- TEMPORARY PAVEMENT

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

LANE CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAINS WITHIN THE CLOSED TRAVEL LANE.

TRAFFIC PATTERN ALTERATIONS

C) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

D) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

E) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

F) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

G) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500' IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

K) WHEN LANE CLOSURES ARE NOT IN EFFECT, SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPENED TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES), AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

L) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

M) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES (DRUMS) PERPENDICULAR TO THE EDGE OF THE TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

MISCELLANEOUS

N) LAW ENFORCEMENT SHALL BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

O) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAYS TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION, AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 500 FT AND 1000 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

P) COORDINATE WITH ENGINEER FOR APPROPRIATE DETOUR SIGNING IN THE EVENT THAT TRADE STREET IS CLOSED FOR CONSTRUCTION ON ADJACENT PROJECT.

Q) PRIOR TO RESURFACING, CONTRACTOR SHALL RECORD LOCATION OF EXISTING MARKINGS.

R) THE CONTRACTOR SHALL PLACE PROPOSED MARKING IN EXISTING LOCATION UNLESS OTHERWISE NOTED IN THE PAVEMENT MARKING PLANS.

0009DEL_P28

HNTB NORTH CAROLINA, P.C.
343 E. S F R a , S 200
Ra , N Ca a 27609
NC L c N : C-1554

DATE: DECEMBER 8, 2017

PROJECT REFERENCE NO.	SHEET NO.
P-5705BA	TMP-1B
R/W SHEET NO.	

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 12/21/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

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THESE NOTES MUST APPEAR ON ANY TRAFFIC CONTROL PLAN

A. Street space is at a minimum so no more space should be used for construction or maintenance work than is absolutely necessary. Through barricading and channelization, the remaining street space is to be used to carry the traffic around the work area in the best way possible under prevailing conditions.

B. Traffic control devices shall be set up prior to the start of construction or maintenance operations, and shall be removed or relocated as the work is finished or work conditions change. The agency doing the work shall patrol the work site as required to ensure that all traffic control devices are in place and operating at all times.

C. All traffic control signs for the work area shall be reflectorized. The reflective materials used shall be equal to or better than the Type 1, Level A reflective sheeting requirements in Section 633 of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP–74).

D. At night, adequate barricades with reflectorized material and lights are required to call attention to and to indicate the actual location of obstructions and hazards.

E. When not in use during work hours or construction inactivity, equipment shall be parked a minimum of 10' away from the travel lane in such a manner as to not create a sight distance problem for motorists.

F. The minimum width for temporary travel lanes is 10'; however, a 12' lane is advisable and should be provided whenever possible.

G. Whenever traffic must be routed across the centerline the two directions of traffic must be physically separated. Traffic cones can be effectively used for this purpose during daylight hours; reflectorized drums must be used at night.

H. Traffic shall not be routed across centerline with cones or drums during non–working hours. Contractor must be on site or change pavement marking appropriately.

I. Generally, the peak flow of traffic occurs in Charlotte between the hours of 7–9 a.m. and 4:30–6:30 p.m., (4–6 p.m. in the CBD) Monday through Friday. During these hours construction activity that involves a lane closure will not be allowed on thoroughfare streets except in emergency situations or with approval from the Charlotte Department of Transportation.

J. The agency doing the work shall provide flaggers and/or Police control when required. Contractor may also be required to provide a uniformed officer to control traffic when working in and around a signalized intersection.

K. Every attempt shall be made to schedule and expedite the work to cause the least inconvenience to the traveling public.

L. In situations not covered in this design, the protection of the traveling public and the protection of the workers on site will dictate the measures to be taken consistent with the City of Charlotte Work Area Traffic Control Handbook (WATCH).

M. The contractor, utility company, or governmental agency involved in the work shall notify the Charlotte Department of Transportation (Jimmy Rhyne at 704–336–3905) of the construction start date and any major work where the number of travel lanes are reduced [Continued next column] from normal conditions or the street is required to be closed. Except in emergencies, the following notification is required:

*Construction start date – 5 working days in advance
*Closing 1 or more travel lanes during Peak Travel Times – 5 working days prior to the scheduled work
*Closing a street – 10 working days prior to the scheduled work.

This lead–time is necessary for planning and notifying the public of expected changes in the normal traffic conditions.

N. Where complete street closure is necessary, the Department of Transportation will coordinate closure of the street and, if necessary, fully sign a detour route.

O. The City Engineer or Director of the Department of Transportation or their representatives are authorized to stop any construction or maintenance activity which is not properly signed and barricaded as required by this standard, the WATCH, and/or the MUTCD until such requirements are met.

P. This design standard cannot be used for all roadway construction situations. it is intended only to be used as a guideline. Specific situations may require engineering judgment in the placement of traffic control devices because of limited vertical and/or horizontal sight distance.

Q. When personnel and/or equipment are within 2' of the edge of an open travel lane, the contractor shall refer to the WATCH for proper lane closure.

R. Operational signs are generally mounted on portable supports. These are usually used for short–term operations to warn and guide traffic. Advanced warning signs (Construction Ahead) shall be mounted on stationary supports seven days prior to the beginning of construction of the roadway.

S. All drums shall be ballasted in such a manner that they will be stable under wind and vehicle action. Ballasting shall be done with sandbags or other yielding material situated in the base of the drums.

T. Construction work shall not be allowed on both sides of the road simultaneously within the same area, unless the roadway is median divided.

U. At the end of each work day the contractor shall backfill up to the edge and elevation of the existing pavement areas within 2 feet of an open travel lane that include a drop off of more than 3 inches in accordance with the WATCH (see Detail)

V. Pavement markings are to be installed by the contractor. Pre–lines must be approved by CDOT prior to placement of the pavement markings. The contractor shall notify Jimmy Rhyne (704–336–3905) of CDOT 5 working days in advance of placing the pre–lines.

W. Traffic Signal work is to be performed by CDOT. The contractor shall notify Jimmy Rhyne (704–336–3905) of CDOT at least 60 days in advance of needed signal work. If a traffic signal uses steel poles and/or mast arms, at least 90 days' advance notice is required.

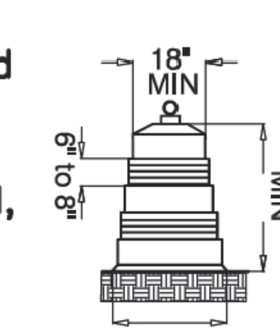
BARRICADE WARNING LIGHTS

	Low Intensity Type A	High Intensity Type B	Steady Burn Type C
Hours of Operation	Dusk to Dawn	24 Hrs/Day	Dusk to Dawn
Minimum Beam Candle Power **	-	-	2 Candles
Minimum Effective Intensity **	4.0 Candelas	35 Candelas	-
Flash Duration	10%	8%	Constant
Flash Rate/Minute ***	55 to 75	55 to 75	Constant
Lens Directional Faces	1 or 2	1	1 or 2

** These values must be maintained within a full 9 degrees on each side of the vertical axis, and 5 degrees above and 5 degrees below the horizontal axis.
*** Length of time that instantaneous intensity is equal to or greater than effective intensity.

TYPE C STEADY BURN WARNING LIGHTS are most commonly mounted on separate portable supports or on Type I or Type II barricades and are inteded to continually warn the driver that he is approaching or adjacent to a hazardous area. Barricade warning lights are portable, lens directed, enclosed lights. The color of the light emitted shall be yellow.

Barricade warning lights shall be in accordance with the requirements of the Institute of Transportation Engineers' (ITE) Standard for Flashing and Steady Burn Barricade Warning Lights (1971).



NON-METALLIC DRUM

Connecting Charlotte

Charlotte Department of Transportation

WORK ZONE TRAFFIC CONTROL NOTES

DATE	REVISION
7/29/04	INITIAL VERSION
11/15/04	CHANGED NOTE "M", ADDED NOTES "V" & "W"

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TRADE STREET DETOUR DETAIL

HNTB NORTH CAROLINA, P.C.
343 E. S F R a , S 200
Ra , N Ca a 27609
NC L c N : C-1554

DATE: DECEMBER 8, 2017

PROJECT REFERENCE NO.	SHEET NO.
P-5705BA	TMP-2
R/W SHEET NO.	

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 12/21/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

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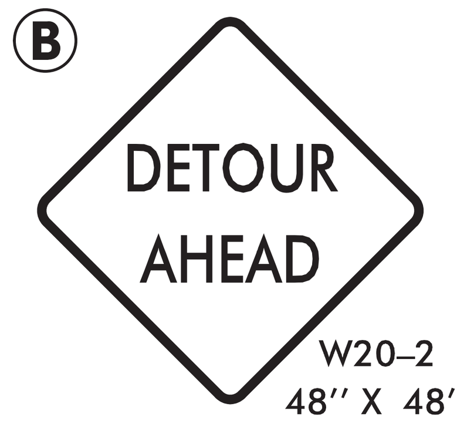
Ⓐ

W20-3
48'' X 48''

Ⓑ



W20-2
48'' X 48''

Ⓒ

C21L
(M4-9L)
30'' X 24''
SP-3

Ⓓ

C21R
(M4-9R)
30'' X 24''
SP-3

Ⓔ

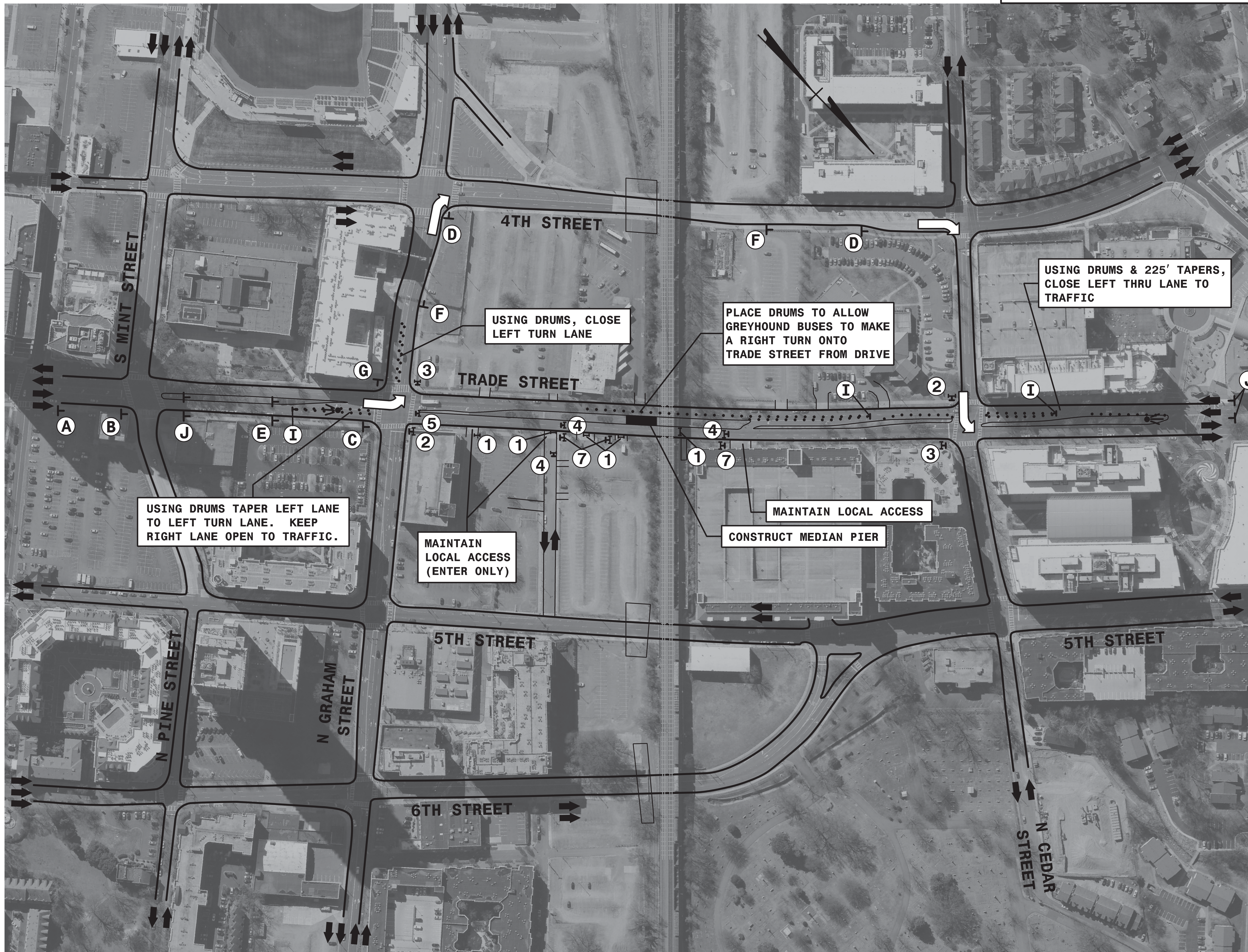
C22L
30'' X 24''
SP-3

Ⓕ

C22R
30'' X 24''
SP-3

Ⓖ

M4-8 A
24'' X 18''

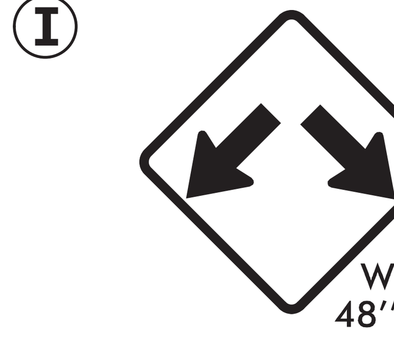


LEGEND

┬	SIGNS
I	TYPE III BARRICADE
Ⱨ	TYPE III BARRICADE W/ SIGN(S)
⮣	DETOUR ROUTE
➡	ORIGINAL PATTERN
•⇚	FLASHING ARROW PANEL

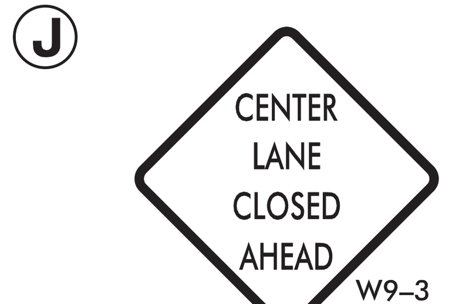
NOTES:
1. REFER TO WATCH-23 FOR GENERAL DETAIL AND NOTES.
2. USE 200' SIGN SPACING WHEN POSSIBLE.
3. SEE GENERAL NOTE M.
4. SEE TMP-3 FOR ADDITIONAL TYPE III BARRICADES AT SITE.
5. SEE TMP-4 FOR SIGN DESIGN DETAIL.

Ⓘ



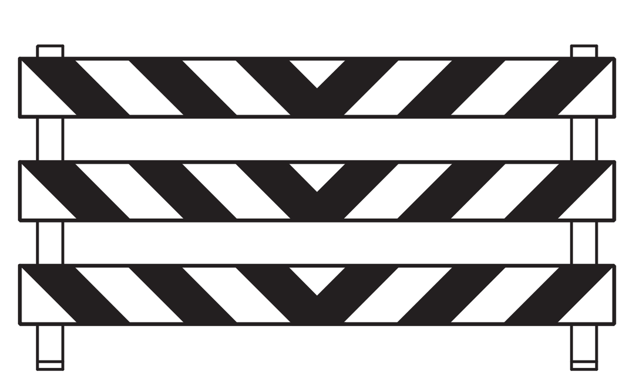
W12-1
48'' X 48''

Ⓙ



W9-3
48'' X 48''

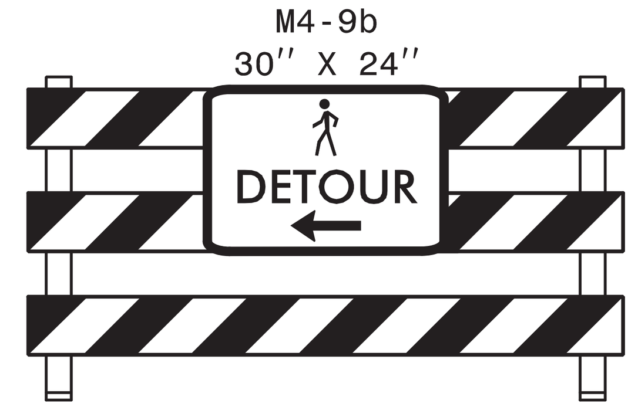
①



TYPE III BARRICADE

②

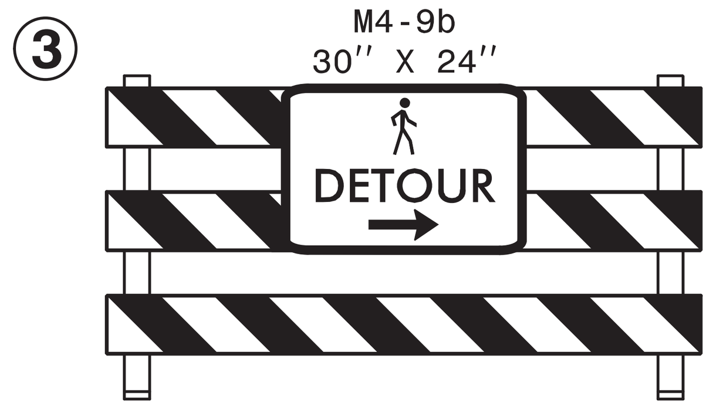
M4-9b
30'' X 24''



TYPE III BARRICADE

③

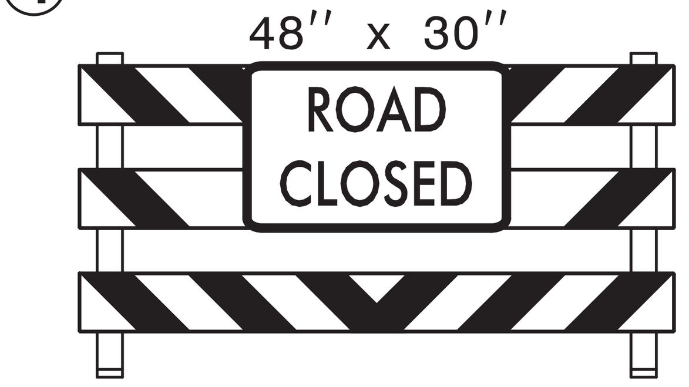
M4-9b
30'' X 24''



TYPE III BARRICADE

④

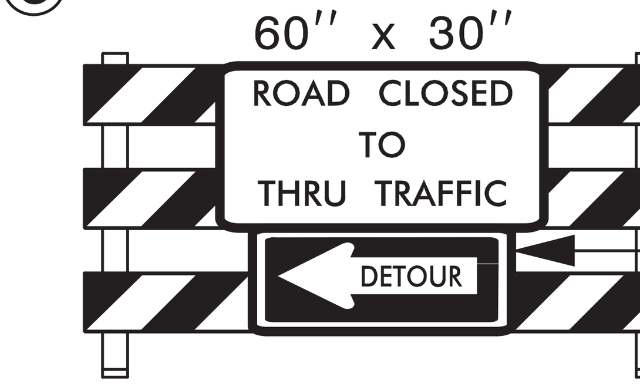
R11-2
48'' x 30''



TYPE III BARRICADE

⑤

R11-4
60'' x 30''



M4-10L
48'' x 18''

TYPE III BARRICADE

⑦

R9-9
24'' X 12''

TYPE III BARRICADE

12/20/2017
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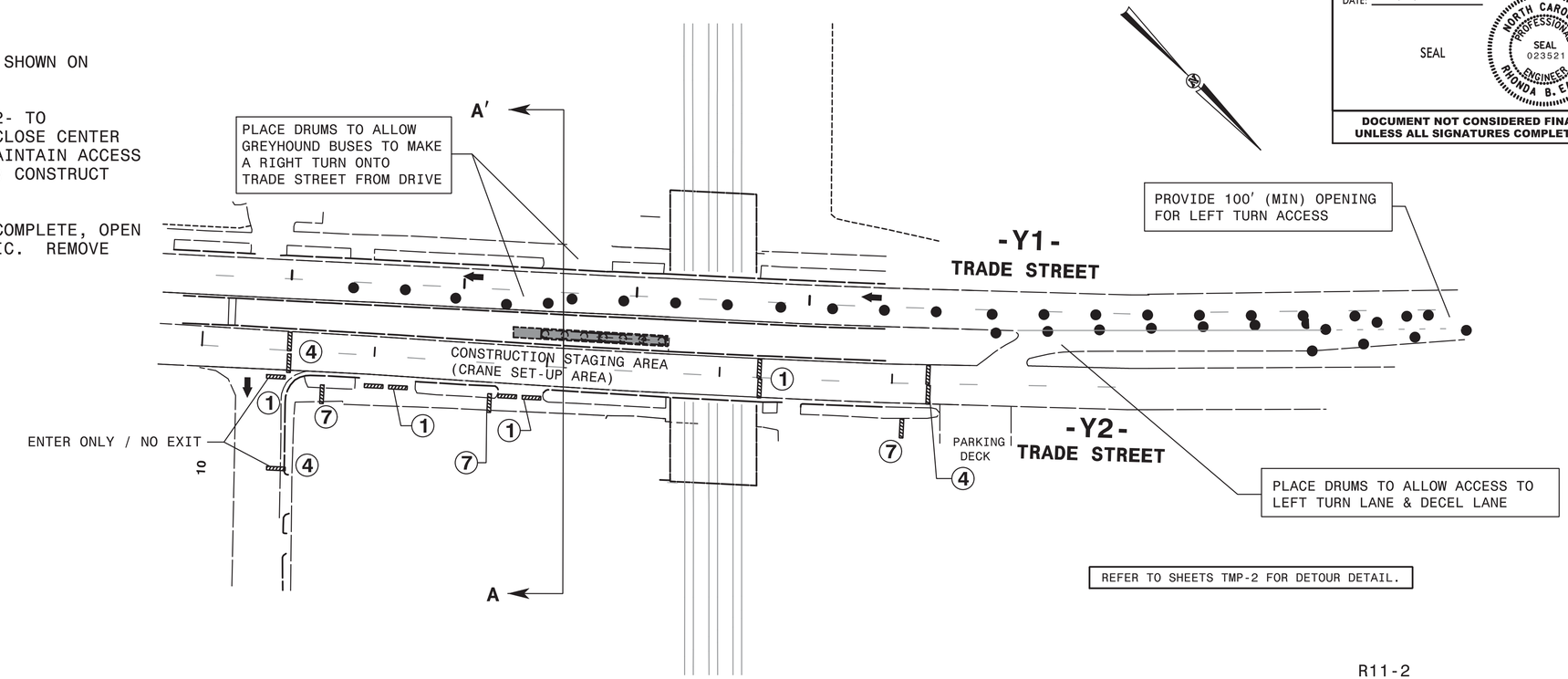
PHASING

PHASE I

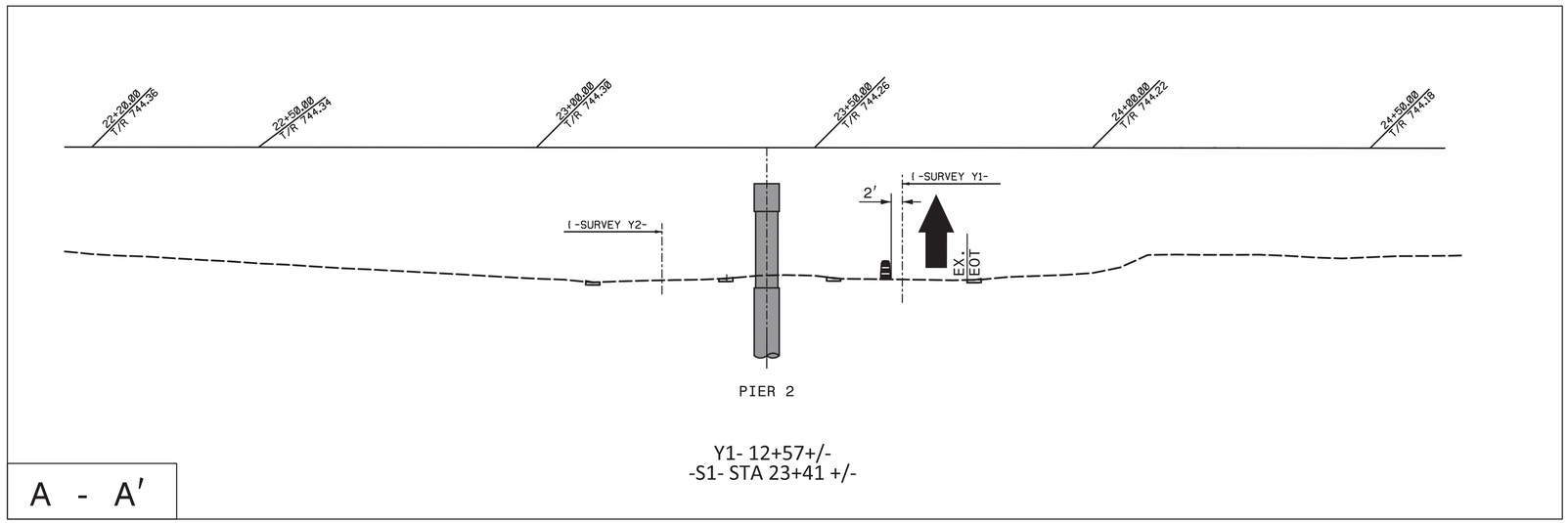
STEP 1 INSTALL AND COVER DETOUR SIGNS AS SHOWN ON SHEET TMP-2.

STEP 2 UNCOVER DETOUR SIGNS AND CLOSE -Y2- TO TRAFFIC. USING WATCH DIAGRAM 27, CLOSE CENTER THRU LANE OF -Y1- TO TRAFFIC. (MAINTAIN ACCESS TO LEFT TURN LANE / PARKING DECK.) CONSTRUCT MEDIAN PIER 2.

STEP 3 ONCE MEDIAN PIER CONSTRUCTION IS COMPLETE, OPEN ALL LANES OF -Y1- & -Y2- TO TRAFFIC. REMOVE DETOUR SIGNS & DEVICES.



REFER TO SHEETS TMP-2 FOR DETOUR DETAIL.



A - A′

④ R11-2 48″ x 30″ ROAD CLOSED
TYPE III BARRICADE

⑦ R9-9 24″ x 12″ SIDEWALK CLOSED
TYPE III BARRICADE

①
TYPE III BARRICADE

HNTB NORTH CAROLINA, P.C.
343 E. S F Ra , S 200
Ra , N Ca a 27609
NC Lc N : C-1554

DATE: DECEMBER 8, 2017

PROJECT REFERENCE NO.	SHEET NO.
P-5705BA	TMP-3

R/W SHEET NO.

APPROVED: Rhonda B. Early (DocuSigned by: F34CAF5AC6BF48A...)

DATE: 12/21/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

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TRADE STREET PHASING

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HNTB — HNTB NORTH CAROLINA, P.C.
343 E. S F R a , S 200
Ra , N Ca a 27609
NC L c N : C-1554

DATE: DECEMBER 8, 2017

PROJECT REFERENCE NO.	SHEET NO.
P-5705BA	TMP-4
R/W SHEET NO.	

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 12/21/2017

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SIGN NUMBER: SP-3
TYPE: D
QUANTITY: X

BACKG COLOR: F e ce O a ge
COPY COLOR: B ac

SYMBOL	X	Y	WID	HT

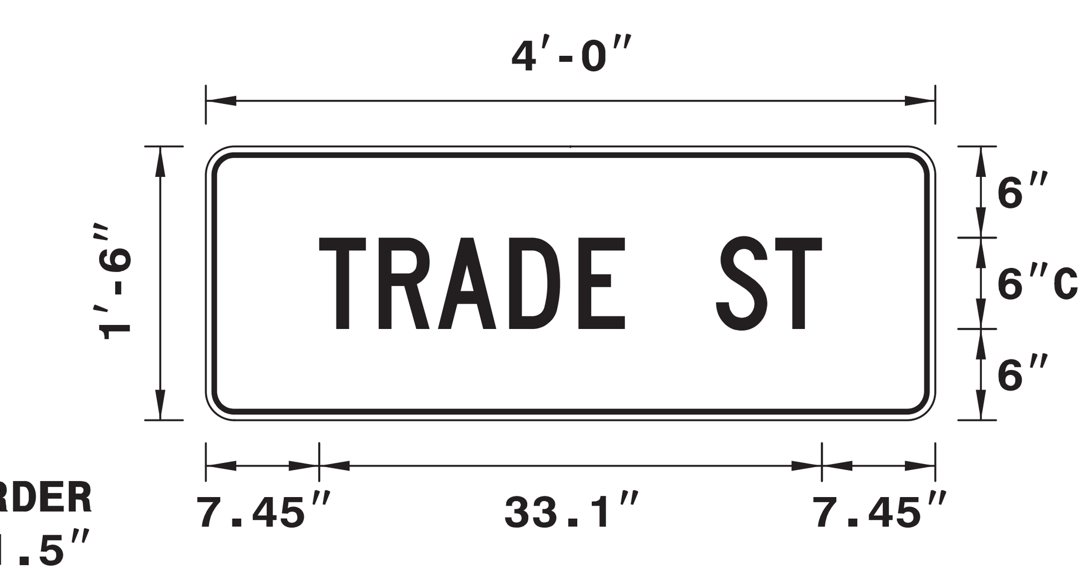
MAT'L: 0.125″ ALUMINUM

SIGN WIDTH: 4′-0″
HEIGHT: 1′-6″
TOTAL AREA: 6.0 S .F .

BORDER TYPE: RECESSED
RECESS: 0.38″
WIDTH: 0.38″
RADII: 1.5″

NO. Z BARS: N/A
LENGTH: N/A

DESIGN BY: TRT
PROJECT ID: P-5705BA
CHECKED BY: ADK
DIV: 10
DATE: Dece be 2017



BORDER
R=1.5″
TH=0.38″
IN=0.38″

Spacing Factor is 1 unless specified otherwise

NOTES:

1. Lege d a d b de a be d ec a ed - ef ec e ee g.
2. Bac g d a be G ade B, f e ce a ge, ef ec e ee g.
3. T be ed De g g.

LETTER POSITIONS

Le e ac g a e a f e e e

		T	R	A	D	E		S	T		Series/Si e Text Length
	7.5	3.9	3.9	4.7	4.6	3.1	6	3.9	3.1	7.5	C 2000 33.1

12/20/2017
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SIGN DESIGN